# LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

## Volume 5 | Technical Appendices

CFA14 | Newton Purcell to Brackley

**Data appendix (LQ-001-014)**

Land quality

November 2013

VOL 5

ES 3.5.2.14.8

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# 1 Introduction

1.1.1 This land quality appendix for the Newton Purcell to Brackley community forum area (CFA14) comprises:

- a summary of engagement undertaken (Section 2);
- detailed risk assessment (Section 3);
- inspection notes and other site data (Section 4);
- geological sites of special scientific interest (SSSI) and local geological sites (LGS) (Section 5); and
- mining and minerals data (Section 6).

1.1.2 Maps referred to throughout the land quality appendix are contained in Maps LQ-01-031 to 035 in Volume 5, Land Quality Map Book.

# 2 Engagement

2.1.1 Table 1 sets out the local authorities and other organisations that have been engaged with during the preparation of the land quality section of the environmental impact assessment (EIA) for this study area, the types of information that have been provided to the assessment team and any specific concerns of those with whom the team engaged.

Table 1: Engagement on land quality issues undertaken for the Newton Purcell to Brackley study area

| **Local authority or other organisation** | **Method/dates of contact** | **Information provided and/or specific concerns** |
|---|---|---|
| Aylesbury Vale District Council<br>(AVDC) | Contact via email on:<br>28 November 2012;<br>10 December 2012; and<br>8 February 2013.<br>Contact via telephone on:<br>6 February 2013. | AVDC supplied the requested data regarding locations of potentially contaminated land in a geographical information system (GIS) shapefile format within 1km of the route. |
| Buckinghamshire County Council<br>(BuCC) | Contact via email on:<br>28 November 2012;<br>3 December 2012;<br>21 December 2012;<br>2 January 2013;<br>23 January 2013;<br>1 February 2013;<br>9 February 2013; and<br>2 May 2013. | Initial email regarding detailed mineral areas for assessing sterilisation of resources and requesting landfill data to provide more detail on what has already been received to assess contamination potential.<br>BuCC responded with links to the Buckinghamshire County Council website.<br>BuCC also supplied GIS data showing preferred areas and landfill data and confirmed it does not have a designated petroleum officer or hold any information on underground storage tanks (UST). |
| Cherwell District Council<br>(CDC) | Contact via email on:<br>28 September 2012;<br>13 December 2012;<br>6 February 2013;<br>7 February 2013; and<br>14 February 2013. | CDC supplied the requested EIA information, including specific planning policies and guidance relating to contaminated land and for information on any sites in the vicinity of the route with potential land contamination or with possible contaminative history. CDC supplied a screen shot of the disused railway near Mixbury to further define the area under inspection. |
| Northamptonshire County Council<br>(NCC) | Contact via email on:<br>6 November 2012; and<br>6 February 2013. | NCC supplied requested information regarding mineral extraction/resources and landfill information with information from searches and GIS files showing mineral safeguarded areas. |
| Oxfordshire County Council<br>(OCC) | Contact via email on:<br>29 October 2012; | OCC supplied requested data regarding mineral areas for assessing sterilisation of resources and landfill data with a GIS layer in a MapInfo format. |

| **Local authority or other organisation** | **Method/dates of contact** | **Information provided and/or specific concerns** |
|---|---|---|
| | 8 January 2012;<br>21 February 2013; and<br>18 March 2013. | |
| South Northamptonshire District Council (SNDC) | Contact via email on:<br>3 October 2012;<br>13 December 2012;<br>6 February 2013;<br>15 March 2013; and<br>9 April 2013. | SNDC confirmed it does not have any data relevant to specific planning policies or guidance related to contaminated land or potential land contamination or with possible contaminative history and the location of potential UST. |
| Environment Agency | Contact via email on:<br>24 April 2013;<br>15 May 2013;<br>24 May 2013;<br>12 June 2013;<br>14 June 2013;<br>27 June 2013; and<br>8 July 2013. | The Environment Agency has been contacted to supply information on landfills within the study area. Data is outstanding at the time of production of this report. |
| Ministry of Defence<br>(MoD) | Contact on unspecified date. | Requests for information on Royal Air Force (RAF) sites in the study area have been made. No information has been received at time of producing this report. |

# 3 Detailed risk assessment

3.1.1 This appendix presents assessments for areas potentially posing a contaminative risk for the Proposed Scheme within the study area. For each site the following data are presented:

- baseline risk assessment;
- construction risk assessment;
- post-construction risk assessment; and
- assessment of temporary (construction) and permanent (post-construction) effects.

3.1.2 This risk assessment incorporates the following assumptions:

- construction workers are not included as part of this assessment;
- sites that have been assessed as potentially posing a contaminative risk to the Proposed Scheme have been grouped and considered together where appropriate. It should be noted that some parcels of land may have had several land uses from different epochs;
- during construction standard mitigation procedures will be in place in accordance with the draft Code of Construction Practice (CoCP) (Volume 5: Appendix CT-003-000); and
- during the post-construction condition it is assumed that all required remediation has been carried out and validated.

3.1.3 The sites assessed in this study area are shown on the Maps LQ-01-031 to 035 (Volume 5, Land Quality Map Book).

Table 2: Sites included in the detailed risk assessment within the Newton Purcell to Brackley study area

| Area reference | Area name | Table numbers |
|---|---|---|
| 14-1 | Finmere Quarry landfill | 3, 16, 29, 42 |
| 14-2 | Finmere railway cutting landfill | 4, 17, 30, 43 |
| 14-3 | Mixbury railway cutting landfill | 5, 18, 31, 44 |
| 14-4 | Historical clay, brick and tile manufacturer | 6, 19, 32, 45 |
| 14-5 | Historical Finmere Station and dismantled railway | 7, 20, 33, 46 |
| 14-6 | Dismantled railway crossing route | 8, 21, 34, 47 |
| 14-7 | Former Royal Air Force (RAF) Turweston, now Turweston Aerodrome, farm and housing | 9, 22, 35, 48 |
| 14-8 | Dismantled railway crossing route (Helmdon disused railway) | 10, 23, 36, 49 |
| 14-9 | Former sand and gravel quarry | 11, 24,37, 50 |

| Area reference | Area name | Table numbers |
|---|---|---|
| 14-10 | Petrol filling station | 12, 25, 38, 51 |
| 14-15 | Historical sand pit | 13, 26, 39, 52 |
| 14-21 | Radstone Turn inert landfill (closed) | 14, 27, 40, 53 |
| 14-22 | Brackley Road sewage works | 15, 28, 41, 54 |

3.1.4 Contaminant types included within the risk assessments are based on the Priority Contaminants Report CLR 8[1]. Although withdrawn, this document is still commonly used and is considered good practice.

3.1.5 The remainder of this section presents the risk assessment for the sites set out in Table 2. The following acronyms are used in these tables:

- SSSI - site of special scientific interest;
- CSM - conceptual site model; and
- VOC - volatile organic compounds.

[2] Defra and Environment Agency, (2002), *Potential contaminants for the assessment of land- R&D Publication,* Bristol, Environment Agency.

## 3.1 Baseline risk assessment

Table 3: Baseline CSM and qualitative risk assessment for Finmere Quarry landfill (Area ref 14-1)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Operational non-hazardous landfill at Finmere Quarry licensed to accept household, commercial and industrial waste<br><br>Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Sensitive land use<br><br>On-site employees | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Likely | Moderate | Moderate |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Low likelihood | Moderate | Moderate/low |
| | | Exposure to asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | Controlled waters<br><br>Secondary A aquifers of the Forest Marble Formation and glaciofluvial deposits at surface over half of this area ref 14-1<br><br>Remainder of area ref 14-1 is on unproductive till at surface | Vertical and lateral migration of contaminated groundwater/leachate | Likely | Minor | Moderate/low |
| | Property<br><br>On-site buildings | Concentration of asphyxiative or explosive gases | Likely | Severe | High |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Low likelihood | Minor | Low |

Table 4: Baseline CSM and qualitative risk assessment for Finmere railway cutting landfill (Area ref 14-2)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Operational Finmere railway cutting landfill licensed to accept non-biodegradable waste<br><br>Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Controlled waters<br><br>Secondary A Forest Marble Formation and glaciofluvial deposits aquifers at surface | Vertical and lateral migration of contaminated groundwater/leachate | Likely | Minor | Moderate/low |

Table 5: Baseline CSM and qualitative risk assessment for Mixbury railway cutting landfill (Area ref 14-3)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Mixbury railway cutting landfill (status unknown) licensed to accept domestic and construction waste. Some fly tipping reported historically<br><br>Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Sensitive land use<br><br>Farm adjacent (residents and workers) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Low likelihood | Moderate | Moderate/low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Low likelihood | Moderate | Moderate/low |
| | | Exposure to asphyxiative or explosive gases | Likely | Severe | High |
| | Controlled waters<br><br>Secondary A White Limestone aquifer | Vertical and lateral migration of contaminated groundwater/leachate | Likely | Minor | Moderate/low |
| | Property | Concentration of asphyxiative or explosive | Likely | Severe | High |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| | Farm buildings adjacent | gases | | | |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Low likelihood | Minor | Low |

Table 6: Baseline CSM and qualitative risk assessment for historical clay, brick and tile manufacturer (Area ref 14-4)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Partially infilled land, remainder is a water body<br><br>Assuming the site has been infilled with waste contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Sensitive land use<br><br>Farm partially on-site and adjacent (residents and workers) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Low likelihood | Moderate | Moderate/low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | Controlled waters<br><br>Secondary A glaciofluvial sand and gravel deposits | Vertical and lateral migration of contaminated groundwater/leachate | Unlikely | Minor | Very low |
| | Property<br><br>Farm buildings partially on-site | Concentration of asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | | Direct contact of below ground building structures and services with | Low likelihood | Negligible | Very low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| | | contaminated groundwater/soil | | | |

Table 7: Baseline CSM and qualitative risk assessment for historical Finmere Station and dismantled railway (Area ref 14-5)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Assessment excludes area assessed under area ref14-3<br><br>Residual contamination in made ground (e.g. ballast) including heavy metals, oils and asbestos. Low levels of ground gas (methane, carbon dioxide and VOC) in areas of potential landfilling | Sensitive land use<br><br>Adjacent housing (including Station House, Shelswell Inn public house, Oaks Farm)<br><br>Adjacent employees (including Shelswell Inn public house, Oaks Farm) | Inhalation/ingestion of or dermal contact with contaminated soils/dust | Unlikely | Moderate | Low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | Controlled waters<br><br>Southern-eastern end of this site, area 14-5 mainly Secondary A glaciofluvial sand and gravel deposits with unproductive till and alluvium<br><br>North-western end of site ref 14-5 mainly Secondary A glaciofluvial aquifer at surface with Principal White Limestone aquifer at surface | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate/low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| | in the vicinity of Mossycorner Spinney | | | | |
| | Property<br><br>Adjacent property (including Station House, Shelswell Inn public house, Oaks Farm) | Concentration of asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Unlikely | Negligible | Very low |

Table 8: Baseline CSM and qualitative risk assessment for dismantled railway crossing route (Area ref 14-6)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Residual contamination in made ground (e.g. ballast) including heavy metals, oils and asbestos. Low levels of ground gas (methane, carbon dioxide and VOC) in areas of potential landfilling | Controlled waters<br><br>Mainly secondary undifferentiated head (clay, silt, sand and gravel) aquifer at surface<br><br>Principal White Limestone aquifer at eastern end of area ref 14-6 | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate/low |
| | Controlled waters<br><br>River Great Ouse within 50m | Lateral migration of contaminated groundwater | Likely | Minor | Moderate/low |
| | | Surface run-off | Low likelihood | Minor | Low |

Table 9: Baseline CSM and qualitative risk assessment for former RAF Turweston, now Turweston Aerodrome, farm and housing (Area ref 14-7)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Contaminants that could be present include, but are not limited to: fuels and oils, degreasants, paints, anti-freeze/de-icers (e.g. glycols), fire-fighting foams, cleaning agents, asbestos | Sensitive land use<br><br>Housing on-site<br><br>On-site employees (farm and aerodrome) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Likely | Moderate | Moderate |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Likely | Moderate | Moderate |
| | | Exposure to asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | Sensitive land use<br><br>Adjacent housing (southern boundary) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Low likelihood | Moderate | Moderate/low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Low likelihood | Moderate | Moderate/low |
| | | Exposure to asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | Controlled waters<br><br>Mainly unproductive strata at surface<br><br>Principal White Limestone aquifer at surface in south-eastern and northern corners of area ref 14-7<br><br>Secondary A aquifer of glaciofluvial sand and gravel deposits on southern boundary of area ref 14-7 | Vertical and lateral migration of contaminated groundwater | Likely | Moderate | Moderate |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| | Property<br><br>On-site buildings (housing, aerodrome, farm)<br><br>Adjacent housing (southern boundary) | Concentration of asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Likely | Minor | Moderate/low |

Table 10: Baseline CSM and qualitative risk assessment for dismantled railway crossing route (Helmdon disused railway) (Area ref 14-8)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Residual contamination in made ground (e.g. ballast) including heavy metals, oils and asbestos. Low levels of ground gas (methane, carbon dioxide and VOC) in areas of potential landfilling | Sensitive land use<br><br>Housing within 50m | Inhalation/ingestion of or dermal contact with contaminated soils/dust | Unlikely | Moderate | Low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | Controlled waters<br><br>Mainly unproductive strata at surface<br><br>Principal aquifers of White Limestone and Taynton Limestone at northern and southern ends of | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate/low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| | area ref 14-8 | | | | |
| | Ecology<br><br>Helmdon Disused Railway SSSI (on-site) | Contact with contaminated soil/groundwater | Unlikely | Moderate | Low |
| | Property<br><br>Housing within 50m | Concentration of asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Low likelihood | Negligible | Very low |

Table 11: Baseline CSM and qualitative risk assessment for former sand and gravel quarry (Area ref 14-9)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Assuming the site has been infilled with waste, contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Controlled waters<br><br>Secondary A glaciofluvial deposits aquifer at surface | Vertical and lateral migration of contaminated groundwater/leachate | Unlikely | Minor | Very low |

Table 12: Baseline CSM and qualitative risk assessment for petrol filling station (Area ref 14-10)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Contaminants could include petrol and diesel | Sensitive land use<br><br>On-site employees | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Unlikely | Moderate | Low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Likely | Moderate | Moderate |
| | | Exposure to asphyxiative or explosive gases | Likely | Severe | High |
| | Controlled waters<br><br>Principal Tayton Limestone Formation aquifer at surface | Vertical and lateral migration of contaminated groundwater | Likely | Moderate | Moderate |
| | Property<br><br>Buildings on-site | Concentration of asphyxiative or explosive gases/vapours | Likely | Severe | High |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Likely | Moderate | Moderate |

Table 13: Baseline CSM and qualitative risk assessment for historical sand pit (Area ref 14-15)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Partially infilled land, remainder is a water body<br><br>Assuming the site has been infilled with waste contaminants that could be present include, but | Controlled waters<br><br>Secondary A glaciofluvial sand and | Vertical and lateral migration of contaminated groundwater/leachate | Unlikely | Minor | Very low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | gravel aquifer at surface | | | | |

Table 14: Baseline CSM and qualitative risk assessment for Radstone Turn inert landfill (closed) (Area ref 14-21)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Recorded as an inert landfill (wastes which remain largely unaltered such as glass, concrete, bricks, tiles, soil and stones)<br><br>Contaminants unlikely unless unauthorised wastes were landfilled | Controlled waters<br><br>Principal Blisworth Limestone aquifer at surface | Vertical and lateral migration of contaminated groundwater/leachate | Unlikely | Minor | Very low |

Table 15: Baseline CSM and qualitative risk assessment for Brackley Road sewage works (Area ref 14-22)

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| Heavy metals, organic compounds e.g. oils, pathogens from sludge which may have been spreading on surrounding land. Also methane, carbon dioxide and VOC if sludge was buried | Sensitive land use<br><br>On-site sewage works employees | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Low likelihood | Moderate | Moderate/low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or | Low likelihood | Severe | Moderate |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline without mitigation |
|---|---|---|---|---|---|
| | | explosive gases | | | |
| | Controlled waters<br><br>Northern end of Area ref14-22 mainly Principal Taynton Limestone and Rutland Formation aquifer at surface<br><br>Mid to Southern end of Area ref14-22 mainly Secondary A Horsehay Sand Formation at surface | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate |
| | Controlled waters<br><br>River Great Ouse within 100m | Lateral migration of contaminated groundwater | Likely | Minor | Moderate/low |
| | | Surface run-off | Low likelihood | Minor | Low |
| | Property<br><br>On-site sewage works building | Concentration of asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Unlikely | Negligible | Very low |

## 3.2 Construction risk assessment

Table 16: Construction CSM and qualitative risk assessment for Finmere Quarry landfill (Area ref 14-1)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Operational non-hazardous landfill at Finmere Quarry licensed to accept household, commercial and industrial waste<br><br>Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Sensitive land use<br><br>On-site employees | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Likely | Moderate | Moderate |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Low likelihood | Moderate | Moderate/low |
| | | Exposure to asphyxiative or explosive gases | Likely | Severe | High |
| | Controlled waters<br><br>Secondary A aquifers of the Forest Marble Formation and glaciofluvial deposits at surface over half of this area ref 14-1<br><br>Remainder of area ref 14-1 is on unproductive till at surface | Vertical and lateral migration of contaminated groundwater/leachate | Likely | Minor | Moderate/low |
| | Property<br><br>On-site buildings | Concentration of asphyxiative or explosive gases | Likely | Severe | High |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Low likelihood | Minor | Low |

Table 17: Construction CSM and qualitative risk assessment for Finmere railway cutting landfill (Area ref 14-2)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Operational Finmere railway cutting landfill licensed to accept non-biodegradable waste<br><br>Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Controlled waters<br><br>Secondary A Forest Marble Formation and glaciofluvial deposits aquifers at surface | Vertical and lateral migration of contaminated groundwater/leachate | Likely | Moderate | Moderate |

Table 18: Construction CSM and qualitative risk assessment for Mixbury railway cutting landfill (Area ref 14-3)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Mixbury railway cutting landfill (status unknown) recorded to have accepted domestic and construction waste. Some fly tipping reported historically<br><br>Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Sensitive land use<br><br>Farm adjacent (residents and workers) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Low likelihood | Moderate | Moderate/low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Low likelihood | Moderate | Moderate/low |
| | | Exposure to asphyxiative or explosive gases | Likely | Severe | High |
| | Controlled waters<br><br>Secondary A White Limestone aquifer | Vertical and lateral migration of contaminated groundwater/leachate | Likely | Minor | Moderate/low |
| | Property | Concentration of asphyxiative or explosive | Likely | Severe | High |

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| | Farm buildings adjacent | gases | | | |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Low likelihood | Minor | Low |

Table 19: Construction CSM and qualitative risk assessment for historical clay, brick and tile manufacturer (Area ref 14-4)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Partially infilled land, remained is a water body<br><br>Assuming the site has been infilled with waste contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Sensitive land use<br><br>Farm partially on-site and adjacent (residents and workers) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Low likelihood | Moderate | Moderate/low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | Controlled waters<br><br>Secondary A glaciofluvial sand and gravel deposits | Vertical and lateral migration of contaminated groundwater/leachate | Unlikely | Minor | Very low |
| | Property<br><br>Farm buildings partially on-site | Concentration of asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | | Direct contact of below ground building structures and services with | Low likelihood | Negligible | Very low |

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| | | contaminated groundwater/soil | | | |

Table 20: Construction CSM and qualitative risk assessment for historical Finmere Station and dismantled railway (Area ref 14-5)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Assessment excludes area assessed under area ref14-3<br><br>Residual contamination in made ground (e.g. ballast) including heavy metals, oils and asbestos. Low levels of ground gas (methane, carbon dioxide and VOC) in areas of potential landfilling | Sensitive land use<br><br>Adjacent housing (Shelswell Inn public house)<br><br>Adjacent employees (Shelswell Inn public house) | Inhalation/ingestion of or dermal contact with contaminated soils/dust | Unlikely | Moderate | Low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | Sensitive land use<br><br>Adjacent housing including Station House and Oaks Farm<br><br>Adjacent employees (Oaks Farm) | None (properties scheduled for demolition) | No contaminant linkage | No contaminant linkage | None |
| | Controlled waters<br><br>Southern-eastern end of this site ref 14-5 mainly Secondary A glaciofluvial sand and gravel deposits with unproductive till and alluvium<br><br>North-western end of area ref 14-5 mainly Secondary A glaciofluvial aquifer at surface with Principal White Limestone aquifer at surface | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate/low |

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| | in the vicinity of Mossycorner Spinney | | | | |
| | Property<br><br>Adjacent property (including Shelswell Inn public house) | Concentration of asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Unlikely | Negligible | Very low |
| | Adjacent property (including Station House, Oaks Farm) | None (properties scheduled for demolition) | No contaminant linkage | No contaminant linkage | None |

Table 21: Construction CSM and qualitative risk assessment for dismantled railway crossing route (Area ref 14-6)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Residual contamination in made ground (e.g. ballast) including heavy metals, oils and asbestos. Low levels of ground gas (methane, carbon dioxide and VOC) in areas of potential landfilling | Controlled waters<br><br>Mainly secondary undifferentiated head (clay, silt, sand and gravel) aquifer at surface<br><br>Principal White Limestone aquifer at eastern end of area ref 14-6 | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate/low |
| | Controlled waters | Lateral migration of contaminated groundwater | Likely | Minor | Moderate/low |

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| | River Great Ouse within 50m | Surface run-off | Low likelihood | Minor | Low |

Table 22: Construction CSM and qualitative risk assessment for former RAF Turweston, now Turweston Aerodrome, farm and housing (Area ref 14-7)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Contaminants that could be present include, but are not limited to: fuels and oils, degreasants, paints, anti-freeze/de-icers (e.g. glycols), fire-fighting foams, cleaning agents, asbestos | Sensitive land use<br>Housing on-site<br>On-site employees (farm and aerodrome) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Likely | Moderate | Moderate |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Likely | Moderate | Moderate |
| | | Exposure to asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | Sensitive land use<br>Adjacent housing (southern boundary) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Low likelihood | Moderate | Moderate/low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Low likelihood | Moderate | Moderate/low |
| | | Exposure to asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | Controlled waters<br>Mainly unproductive strata at surface<br>Principal White Limestone aquifer | Vertical and lateral migration of contaminated groundwater | Likely | Moderate | Moderate |

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| | at surface in south-eastern and northern corners of area ref 14-7<br><br>Secondary A aquifer of glaciofluvial sand and gravel deposits on southern boundary of area ref 14-7 | | | | |
| | Property<br><br>On-site buildings (housing, aerodrome, farm)<br><br>Adjacent housing (southern boundary) | Concentration of asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Likely | Minor | Moderate/low |

Table 23: Construction CSM and qualitative risk assessment for dismantled railway crossing route (Helmdon disused railway) (Area ref 14-8)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Residual contamination in made ground (e.g. ballast) including heavy metals, oils and asbestos. Low levels of ground gas (methane, carbon dioxide and VOC) in areas of potential landfilling | Sensitive land use<br><br>Housing within 50m | Inhalation/ingestion of or dermal contact with contaminated soils/dust | Unlikely | Moderate | Low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| | Controlled waters<br><br>Mainly unproductive strata at surface<br><br>Principal aquifers of White Limestone and Taynton Limestone at northern and southern ends of area ref 14-8 | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate/low |
| | Ecology<br><br>Helmsdon Disused Railway SSSI (on-site) | Contact with contaminated soil/groundwater | Low likelihood | Moderate | Moderate/low |
| | Property<br><br>Housing within 50m. | Concentration of asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Low likelihood | Negligible | Very low |

Table 24: Construction CSM and qualitative risk assessment for former sand and gravel quarry (Area ref 14-9)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Assuming the site has been infilled with waste contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, | Controlled waters<br><br>Secondary A glaciofluvial deposits aquifer at surface | Vertical and lateral migration of contaminated groundwater | Unlikely | Moderate | Low |

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| carbon dioxide and VOC) | | | | | |

Table 25: Construction CSM and qualitative risk assessment for petrol filling station (Area ref 14-10)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Contaminants could include petrol and diesel | Sensitive land use<br><br>On-site employees | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Unlikely | Moderate | Low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Likely | Moderate | Moderate |
| | | Exposure to asphyxiative or explosive gases | Likely | Severe | High |
| | Controlled waters –<br><br>Principal Tayton Limestone Formation aquifer at surface | Vertical and lateral migration of contaminated groundwater | Likely | Moderate | Moderate |
| | Property<br><br>Buildings on-site | Concentration of asphyxiative or explosive gases/vapours | Likely | Severe | High |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Likely | Moderate | Moderate |

Table 26: Construction CSM and qualitative risk assessment for historical sand pit (Area ref 14-15)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Partially infilled land, remained is a water body<br><br>Assuming the site has been infilled with waste contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Controlled waters<br><br>Secondary A glaciofluvial sand and gravel aquifer at surface | Vertical and lateral migration of contaminated groundwater/leachate | Unlikely | Moderate | Low |

Table 27: Construction CSM and qualitative risk assessment for Radstone Turn inert landfill (closed) (Area ref 14-21)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Recorded as an inert landfill (wastes which remain largely unaltered such as glass, concrete, bricks, tiles, soil and stones)<br><br>Contaminants unlikely unless unauthorised wastes were landfilled | Controlled waters<br><br>Principal Blisworth Limestone aquifer at surface | Vertical and lateral migration of contaminated groundwater/leachate | Unlikely | Minor | Very low |

Table 28: Construction CSM and qualitative risk assessment for Brackley Road sewage works (Area ref 14-22)

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| Heavy metals, organic compounds e.g. oils, pathogens from sludge which may have been spreading on surrounding land. Also methane, | Sensitive land use<br><br>On-site sewage works employees | Inhalation/ingestion of or dermal contact with windblown contaminated | Low likelihood | Moderate | Moderate/low |

| Source | Receptor | Pathway | Probability | Consequence | Risk with construction stage mitigation |
|---|---|---|---|---|---|
| carbon dioxide and VOC if sludge was buried | | soils/dust | | | |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | Controlled waters<br><br>Northern end of Area ref14-22 mainly Principal Taynton Limestone and Rutland Formation aquifer at surface<br><br>Mid to Southern end of Area ref14-22 mainly Secondary A Horsehay Sand Formation at surface | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate |
| | Controlled waters<br><br>River Great Ouse within 100m | Lateral migration of contaminated groundwater | Likely | Minor | Moderate/low |
| | River Great Ouse within 100m | Surface run-off | Low likelihood | Minor | Low |
| | Property<br><br>On-site sewage works building | Concentration of asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Unlikely | Negligible | Very low |

## 3.3 Post-construction risk assessment

Table 29: Post-Construction CSM and qualitative risk assessment for Finmere Quarry landfill (Area ref 14-1)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Operational non-hazardous landfill at Finmere Quarry licensed to accept household, commercial and industrial waste<br><br>Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Sensitive land use<br><br>On-site employees | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Likely | Moderate | Moderate |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Low likelihood | Moderate | Moderate/low |
| | | Exposure to asphyxiative or explosive gases | Likely | Severe | High |
| | Controlled waters<br><br>Secondary A aquifers of the Forest Marble Formation and glaciofluvial deposits at surface over half of this area ref 14-1<br><br>Remainder of area ref 14-1 is on unproductive till at surface | Vertical and lateral migration of contaminated groundwater/leachate | Likely | Minor | Moderate/low |
| | Property<br><br>On-site buildings | Concentration of asphyxiative or explosive gases | Likely | Severe | High |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Low likelihood | Minor | Low |

Table 30: Post-Construction CSM and qualitative risk assessment for Finmere railway cutting landfill (Area ref 14-2)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Operational Finmere railway cutting landfill licensed to accept non-biodegradable waste<br><br>Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Controlled waters<br><br>Secondary A Forest Marble Formation and glaciofluvial deposits aquifers at surface | Vertical and lateral migration of contaminated groundwater/leachate | Unlikely | Minor | Very low |

Table 31: Post-Construction CSM and qualitative risk assessment for Mixbury railway cutting landfill (Area ref 14-3)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Mixbury railway cutting landfill (status unknown) recorded to have accepted domestic and construction waste. Some fly tipping reported historically<br><br>Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Sensitive land use<br><br>Farm adjacent (residents and workers) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Low likelihood | Moderate | Moderate/low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Low likelihood | Moderate | Moderate/low |
| | | Exposure to asphyxiative or explosive gases | Likely | Severe | High |
| | Controlled waters<br><br>Secondary A White Limestone aquifer | Vertical and lateral migration of contaminated groundwater/leachate | Likely | Minor | Moderate/low |
| | Property | Concentration of | Likely | Severe | High |

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| | Farm buildings adjacent | asphyxiative or explosive gases | | | |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Low likelihood | Minor | Low |

Table 32: Post-Construction CSM and qualitative risk assessment for historical clay, brick and tile manufacturer (Area ref 14-4)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Partially infilled land, remained is a water body<br><br>Assuming the site has been infilled with waste contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Sensitive land use<br><br>Farm partially on-site and adjacent (residents and workers) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Low likelihood | Moderate | Moderate/low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | Controlled waters<br><br>Secondary A glaciofluvial sand and gravel deposits | Vertical and lateral migration of contaminated groundwater/leachate | Unlikely | Minor | Very low |
| | Property<br><br>Farm buildings partially on-site | Concentration of asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | | Direct contact of below ground building structures | Low likelihood | Negligible | Very low |

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| | | and services with contaminated groundwater/soil | | | |

Table 33: Post-Construction CSM and qualitative risk assessment for historical Finmere Station and dismantled railway (Area ref 14-5)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Assessment excludes area assessed under area ref14-3<br><br>Residual contamination in made ground (e.g. ballast) including heavy metals, oils and asbestos. Low levels of ground gas (methane, carbon dioxide and VOC) in areas of potential landfilling | Sensitive land use<br><br>Adjacent housing (Shelswell Inn public house)<br><br>Adjacent employees (Shelswell Inn public house) | Inhalation/ingestion of or dermal contact with contaminated soils/dust | Unlikely | Moderate | Low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | Sensitive land use<br><br>Adjacent housing including Station House and Oaks Farm<br><br>Adjacent employees (Oaks Farm) | None (properties scheduled for demolition) | No contaminant linkage | No contaminant linkage | None |
| | Controlled waters<br><br>Southern-eastern end of this area ref 14-5 mainly Secondary A glaciofluvial sand and gravel deposits with unproductive till and alluvium<br><br>North-western end of area ref 14-5 mainly Secondary A glaciofluvial aquifer at surface with Principal White Limestone aquifer at surface in the vicinity of Mossycorner Spinney | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate/low |

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| | Property<br><br>Adjacent property (including Shelswell Inn public house) | Concentration of asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Low likelihood | Negligible | Very low |
| | Adjacent property (including Station House, Oaks Farm) | None (properties scheduled for demolition) | No contaminant linkage | No contaminant linkage | None |

Table 34: Post-Construction CSM and qualitative risk assessment for dismantled railway crossing route (Area ref 14-6)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Residual contamination in made ground (e.g. ballast) including heavy metals, oils and asbestos. Low levels of ground gas (methane, carbon dioxide and VOC) in areas of potential landfilling | Controlled waters<br><br>Mainly secondary undifferentiated head (clay, silt, sand and gravel) aquifer at surface<br><br>Principal White Limestone aquifer at eastern end of area ref 14-6 | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate/low |
| | Controlled waters<br><br>River Great Ouse within 50m | Lateral migration of contaminated groundwater | Likely | Minor | Moderate/low |
| | | Surface run-off | Low likelihood | Minor | Low |

Table 35: Post-Construction CSM and qualitative risk assessment for former RAF Turweston, now Turweston Aerodrome, farm and housing (Area ref 14-7)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Contaminants that could be present include, but are not limited to: fuels and oils, degreasants, paints, anti-freeze/de-icers (e.g. glycols), fire-fighting foams, cleaning agents, asbestos | Sensitive land use<br><br>Housing on-site<br><br>On-site employees (farm and aerodrome) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Likely | Moderate | Moderate |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Likely | Moderate | Moderate |
| | | Exposure to asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | Sensitive land use<br><br>Adjacent housing (southern boundary) | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Low likelihood | Moderate | Moderate/low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Low likelihood | Moderate | Moderate/low |
| | | Exposure to asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | Controlled waters<br><br>Mainly unproductive strata at surface<br><br>Principal White Limestone aquifer at surface in south-eastern and northern corners of area ref 14-7<br><br>Secondary A aquifer of glaciofluvial sand and gravel deposits on southern boundary of area ref 14-7 | Vertical and lateral migration of contaminated groundwater | Likely | Moderate | Moderate |

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| | Property<br><br>On-site buildings (housing, aerodrome, farm)<br><br>Adjacent housing (southern boundary) | Concentration of asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Likely | Minor | Moderate/low |

Table 36: Post-Construction CSM and qualitative risk assessment for dismantled railway crossing route (Helmdon disused railway) (Area ref 14-8)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Residual contamination in made ground (e.g. ballast) including heavy metals, oils and asbestos. Low levels of ground gas (methane, carbon dioxide and VOC) in areas of potential landfilling | Sensitive land use<br><br>Housing within 50m | Inhalation/ingestion of or dermal contact with contaminated soils/dust | Unlikely | Moderate | Low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or explosive gases | Unlikely | Severe | Moderate/low |
| | Controlled waters<br><br>Mainly unproductive strata at surface<br><br>Principal aquifers of White Limestone and Taynton Limestone | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate/low |

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| | at northern and southern ends of area ref 14-8 | | | | |
| | Ecology<br><br>Helmdon Disused Railway SSSI (on-site) | Contact with contaminated soil/groundwater | Unlikely | Moderate | Low |
| | Property<br><br>Housing within 50m | Concentration of asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Low likelihood | Negligible | Very low |

Table 37: Post-Construction CSM and qualitative risk assessment for former sand and gravel quarry (Area ref 14-9)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Assuming the site has been infilled with waste, contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Controlled waters<br><br>Secondary A glaciofluvial deposits aquifer at surface | Vertical and lateral migration of contaminated groundwater/leachate | No contaminant linkage | No contaminant linkage | None |

Table 38: Post-Construction CSM and qualitative risk assessment for petrol filling station (Area ref 14-10)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Contaminants could include petrol and diesel | Sensitive land use<br>On-site employees | Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust | Unlikely | Moderate | Low |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Likely | Moderate | Moderate |
| | | Exposure to asphyxiative or explosive gases | Likely | Severe | High |
| | Controlled waters<br>Principal Tayton Limestone<br>Formation aquifer at surface | Vertical and lateral migration of contaminated groundwater | Likely | Moderate | Moderate |
| | Property<br>Buildings on-site | Concentration of asphyxiative or explosive gases/vapours | Likely | Severe | High |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Likely | Moderate | Moderate |

Table 39: Post-Construction CSM and qualitative risk assessment for historical sand pit (Area ref 14-15)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Partially infilled land, remained is a water body<br><br>Assuming the site has been infilled with waste contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds such as ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC) | Controlled waters<br><br>Secondary A glaciofluvial sand and gravel aquifer at surface | Vertical and lateral migration of contaminated groundwater/leachate | Unlikely | Moderate | Low |

Table 40: Post Construction CSM and qualitative risk assessment for Radstone Turn inert landfill (closed) (Area ref 14-21)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Recorded as an inert landfill (wastes which remain largely unaltered such as glass, concrete, bricks, tiles, soil and stones)<br><br>Contaminants unlikely unless unauthorised wastes were landfilled | Controlled waters<br><br>Principal Blisworth Limestone aquifer at surface | Vertical and lateral migration of contaminated groundwater/leachate | No contaminant linkage | No contaminant linkage | None |

Table 41: Post construction CSM and qualitative risk assessment for Brackley Road sewage works (Area ref 14-22)

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| Heavy metals, organic compounds e.g. oils, | Sensitive land use | Inhalation/ingestion of or | Low likelihood | Moderate | Moderate/low |

| Source | Receptor | Pathway | Probability | Consequence | Risk with permanent works mitigation |
|---|---|---|---|---|---|
| pathogens from sludge which may have been spreading on surrounding land. Also methane, carbon dioxide and VOC if sludge was buried | On-site sewage works employees | dermal contact with windblown contaminated soils/dust | | | |
| | | Inhalation of vapours derived from contaminated groundwater/soil | Unlikely | Moderate | Low |
| | | Exposure to asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | Controlled waters<br><br>Northern end of Area ref14-22 mainly Principal Taynton Limestone and Rutland Formation aquifer at surface<br><br>Mid to Southern end of Area ref14-22 mainly Secondary A Horsehay Sand Formation at surface | Vertical and lateral migration of contaminated groundwater | Low likelihood | Moderate | Moderate |
| | Controlled waters<br><br>River Great Ouse within 100m | Lateral migration of contaminated groundwater | Likely | Minor | Moderate/low |
| | | Surface run-off | Low likelihood | Minor | Low |
| | Property<br><br>On-site sewage works building | Concentration of asphyxiative or explosive gases | Low likelihood | Severe | Moderate |
| | | Direct contact of below ground building structures and services with contaminated groundwater/soil | Unlikely | Negligible | Very low |

## 3.4 Assessment of temporary (construction) and permanent (post-construction) effects

Table 42: Significance of impact during construction and post construction for Finmere Quarry landfill (Area ref 14-1)

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Inhalation/ingestion/dermal contact of contaminated soils/dusts by on-site landfill employees | Moderate | Moderate | Moderate | Negligible | Negligible |
| Inhalation of vapours derived from contaminated groundwater/soil by on-site landfill employees | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Exposure to asphyxiative or explosive gases by on-site landfill employees | Moderate | Moderate | Moderate | Negligible | Negligible |
| Vertical and lateral migration of contaminated groundwater/leachate into the Secondary A Forest Marble and glaciofluvial deposits aquifers at surface | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Lateral migration and concentration of asphyxiative or explosive gases in on-site buildings | High | High | High | Negligible | Negligible |
| Direct contact of below ground building structures and services on-site with contaminated groundwater/soil | Low | Low | Low | Negligible | Negligible |
| Overall significance | | | | Negligible | Negligible |

Table 43: Significance of impact during construction and post construction for Finmere railway cutting landfill (Area ref 14-2)

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Vertical and lateral migration of contaminated groundwater/leachate into the Secondary A Forest Marble and glaciofluvial deposits aquifers at surface | Moderate/low | Moderate | Very low | Minor adverse effect | Moderate beneficial effect |
| Overall significance | | | | Minor adverse effect | Moderate beneficial effect |

Table 44: Significance of impact during construction and post construction for Mixbury railway cutting landfill (Area ref 14-3)

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Inhalation/ingestion/dermal contact of contaminated soils/dusts by adjacent farm residents/ employees | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Inhalation of vapours derived from contaminated groundwater/soil by adjacent farm residents/ employees | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Exposure to asphyxiative or explosive gases by adjacent farm residents/ employees | High | High | High | Negligible | Negligible |
| Vertical and lateral migration of contaminated groundwater/leachate into the Secondary A White Limestone and glaciofluvial deposits aquifers at surface | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Lateral migration and concentration of asphyxiative or explosive gases in adjacent farm buildings | High | High | High | Negligible | Negligible |
| Direct contact of below ground building structures and services in adjacent farm buildings with contaminated groundwater/soil | Low | Low | Low | Negligible | Negligible |
| Overall significance | | | | Negligible | Negligible |

Table 45: Significance of impact during construction and post construction for historical clay, brick and tile manufacturer (Area ref 14-4)

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Inhalation/ingestion/dermal contact of contaminated soils/dusts by on-site and adjacent farm residents/ employees | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Inhalation of vapours derived from contaminated groundwater/soil by on-site and adjacent farm residents/ employees | Low | Low | Low | Negligible | Negligible |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Exposure to asphyxiative or explosive gases by on-site and adjacent farm residents or employees | Moderate | Moderate | Moderate | Negligible | Negligible |
| Vertical and lateral migration of contaminated groundwater/leachate into the Secondary A White Limestone and glaciofluvial deposits aquifers at surface | Very low | Very low | Very low | Negligible | Negligible |
| Lateral migration and concentration of asphyxiative or explosive gases in on-site and adjacent farm buildings | Moderate | Moderate | Moderate | Negligible | Negligible |
| Direct contact of below ground building structures and services on-site and adjacent farm buildings with contaminated groundwater/soil | Very low | Very low | Very low | Negligible | Negligible |
| Overall significance | | | | Negligible | Negligible |

Table 46: Significance of impact during construction and post construction for historical Finmere Station and dismantled railway (Area ref 14-5)

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Inhalation/ingestion/dermal contact of contaminated soils/dusts by adjacent residents and commercial employees (public house) | Low | Low | Low | Negligible | Negligible |
| Inhalation of vapours derived from contaminated groundwater/soil by adjacent residents and commercial employees (public house) | Low | Low | Low | Negligible | Negligible |
| Exposure to asphyxiative or explosive gases by adjacent residents and commercial employees (public house) | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Inhalation/ingestion/dermal contact of contaminated soils/dusts by adjacent residents and employees (housing and farm) | Low | None | None | Moderate beneficial effect | Moderate beneficial effect |
| Inhalation of vapours derived from contaminated | Low | None | None | Moderate beneficial | Moderate beneficial effect |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| groundwater/soil by adjacent residents and employees (housing and farm) | | | | effect | |
| Exposure to asphyxiative or explosive gases by adjacent residents and employees (housing and farm) | Moderate/low | None | None | Moderate beneficial effect | Moderate beneficial effect |
| Vertical and lateral migration of contaminated groundwater into the Secondary A aquifers at surface | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Concentration of asphyxiative or explosive gases in adjacent housing and commercial buildings (public house) | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Concentration of asphyxiative or explosive gases in adjacent housing and farm | Moderate/low | None | None | Moderate beneficial effect | Moderate beneficial effect |
| Direct contact of below ground adjacent building structures and services (public house) with contaminated groundwater/soil | Very low | Very low | Very low | Negligible | Negligible |
| Direct contact of below ground adjacent building structures and services (housing and farm) with contaminated groundwater/soil | Very low | None | None | Minor beneficial effect | Minor beneficial effect |
| Overall significance | | | | Negligible | Negligible |

Table 47: Significance of impact during construction and post construction for dismantled railway crossing route (Area ref 14-6)

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Vertical and lateral migration of contaminated groundwater into the Principal White Limestone and secondary undifferentiated head deposits aquifers at surface | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Lateral migration of contaminated groundwater into the River Great Ouse within 50m | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Surface run-off into the River Great Ouse within 50m | Low | Low | Low | Negligible | Negligible |
| Overall significance | | | | Negligible | Negligible |

Table 48: Significance of impact during construction and post construction for former RAF Turweston, now Turweston Aerodrome, farm and housing (Area ref 14-7)

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Inhalation/ingestion/dermal contact of contaminated soils/dusts by on-site residents and employees (farm and aerodrome) | Moderate | Moderate | Moderate | Negligible | Negligible |
| Inhalation of vapours derived from contaminated groundwater/soil by on-site residents and employees (farm and aerodrome) | Moderate | Moderate | Moderate | Negligible | Negligible |
| Exposure to asphyxiative or explosive gases by on-site residents and employees (farm and aerodrome) | Moderate | Moderate | Moderate | Negligible | Negligible |
| Inhalation/ingestion/dermal contact of contaminated soils/dusts by adjacent residents (southern boundary) | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Inhalation of vapours derived from contaminated groundwater/soil by adjacent residents (southern boundary) | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Exposure to asphyxiative or explosive gases by adjacent residents (southern boundary) | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Vertical and lateral migration of contaminated groundwater into the Principal White Limestone and Secondary A glaciofluvial sand and gravel aquifers at surface | Moderate | Moderate | Moderate | Negligible | Negligible |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Concentration of asphyxiative or explosive gases in on-site and adjacent buildings | Moderate | Moderate | Moderate | Negligible | Negligible |
| Direct contact of below ground building structures and services on-site and adjacent with contaminated groundwater/soil | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Overall significance | | | | Negligible | Negligible |

Table 49: Significance of impact during construction and post construction for dismantled railway crossing route (Helmdon disused railway) (Area ref 14-8)

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Inhalation/ingestion/dermal contact of contaminated soils/dusts by residents within 50m | Low | Low | Low | Negligible | Negligible |
| Inhalation of vapours derived from contaminated groundwater/soil by residents within 50m | Low | Low | Low | Negligible | Negligible |
| Exposure to asphyxiative or explosive gases by residents within 50m | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Vertical and lateral migration of contaminated groundwater into the Principal White Limestone and Taynton Limestone aquifers at surface | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Contact with contaminated soil/groundwater in Helmdon Disused Railway SSSI | Low | Moderate/low | Low | Minor adverse effect | Negligible |
| Lateral migration and concentration of asphyxiative or explosive gases in housing within 50m | Moderate/low | Moderate | Moderate | Minor adverse effect | Minor adverse effect |
| Direct contact of below ground building structures and services within 50m with contaminated groundwater/soil | Very low | Very low | Very low | Negligible | Negligible |
| Overall significance | | | | Minor adverse effect | Negligible |

Table 50: Significance of impact during construction and post construction for former sand and gravel quarry (Area ref 14-9)

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Vertical and lateral migration of contaminated groundwater/leachate into the Secondary A glaciofluvial deposits aquifer at surface | Very low | Low | None | Minor adverse effect | Minor beneficial effect |
| Overall significance | | | | Minor adverse effect | Minor beneficial effect |

Table 51: Significance of impact during construction and post construction for petrol filling station (Area ref 14-10)

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction significance | Post-construction significance |
|---|---|---|---|---|---|
| Inhalation/ingestion/dermal contact of contaminated soils/dusts by on-site petrol filling station employees | Low | Low | Low | Negligible | Negligible |
| Inhalation of vapours derived from contaminated groundwater/soil by on-site petrol filling station employees | Moderate | Moderate | Moderate | Negligible | Negligible |
| Exposure to asphyxiative or explosive gases by petrol filling station employees | High | High | High | Negligible | Negligible |
| Vertical and lateral migration of contaminated groundwater into the Principal Tayton Limestone Formation aquifer at surface | Moderate | Moderate | Moderate | Negligible | Negligible |
| Lateral migration and concentration of asphyxiative or explosive gases in on-site buildings | High | High | High | Negligible | Negligible |
| Direct contact of below ground building structures and services on-site with contaminated groundwater/soil | Moderate | Moderate | Moderate | Negligible | Negligible |
| Overall significance | | | | Negligible | Negligible |

Table 52: Significance of impact during construction and post construction for historical sand pit (Area ref 14-15)

| **Contaminant linkage** | **Baseline risk** | **Construction risk** | **Post-construction risk** | **Construction significance** | **Post-construction significance** |
|---|---|---|---|---|---|
| Vertical and lateral migration of contaminated groundwater/leachate into the Secondary A glaciofluvial deposits aquifers at surface | Very low | Low | Low | Minor adverse effect | Minor adverse effect |
| Overall significance | | | | Minor adverse effect | Minor adverse effect |

Table 53: Significance of impact during construction and post construction for Radstone Turn inert landfill (closed) (Area ref 14-21)

| **Contaminant linkage** | **Baseline risk** | **Construction risk** | **Post-construction risk** | **Construction significance** | **Post-construction significance** |
|---|---|---|---|---|---|
| Vertical and lateral migration of contaminated groundwater/leachate into Principal Blisworth Limestone aquifer at surface | Very low | Very low | None | Negligible | Minor beneficial effect |
| Overall significance | | | | Negligible | Minor beneficial effect |

Table 54: Significance of impact during construction and post construction for Brackley Road sewage works (Area ref 14-22)

| **Contaminant linkage** | **Baseline risk** | **Construction risk** | **Post-construction Risk** | **Construction significance** | **Post-construction significance** |
|---|---|---|---|---|---|
| Inhalation/ingestion/dermal contact of contaminated soils/dusts by on-site sewage works employees | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Inhalation of vapours derived from contaminated groundwater/soil by on-site sewage works employees | Low | Low | Low | Negligible | Negligible |
| Exposure to asphyxiative or explosive gases by on-site sewage works employees | Moderate | Moderate | Moderate | Negligible | Negligible |

| **Contaminant linkage** | **Baseline risk** | **Construction risk** | **Post-construction Risk** | **Construction significance** | **Post-construction significance** |
|---|---|---|---|---|---|
| Vertical and lateral migration of contaminated groundwater into the Principal Taynton Limestone and Rutland Formation aquifers at surface | Moderate | Moderate | Moderate | Negligible | Negligible |
| Lateral migration of contaminated groundwater into the River Great Ouse within 100m | Moderate/low | Moderate/low | Moderate/low | Negligible | Negligible |
| Surface run-off into the River Great Ouse within 100m | Low | Low | Low | Negligible | Negligible |
| Concentration of asphyxiative or explosive gases in on-site buildings | Moderate | Moderate | Moderate | Negligible | Negligible |
| Direct contact of below ground building structures and services on-site with contaminated groundwater/soil | Very low | Very low | Very low | Negligible | Negligible |
| Overall significance | | | | Negligible | Negligible |

# 4 Inspections notes and other site data

4.1.1 This appendix presents site inspection notes for those key potentially contaminated sites visited during the study period. No other site data were obtained.

Table 55: Site inspection data from Area ref 14-1

| **Inspection location (Land Parcel Ref: ON132809)** | **Details** | |
|---|---|---|
| **Area ref number** | 14-1 | |
| **Date of inspection** | 29 January 2013 | |
| **Site location** | Finmere Quarry, Finmere, Oxfordshire | |
| **Site access** | Private road leading from A421 | |
| **Site description** | Operational non-hazardous landfill at Finmere Quarry | |
| **Topography and surroundings - elevation in relation to surroundings, hummocks and breaks of slope** | Flat terrain, surrounded by fields | |
| **Neighbouring site use (in particular note any potentially contaminative activities or sensitive receptors** | north | fields |
| | south | fields |
| | east | fields |
| | west | fields |
| **Site buildings - extent, size, type and usage. Boiler rooms, electrical switchgear** | Portable elevated cabin, leachate treatment plant, and concrete pad car park. Cover approximately <5% total site surface | |
| **Ground surfacing - type and condition** | Concrete, and gravel pad in building area (<5% total site). Remainder of site active landfill | |
| **Vegetation - evidence of distress, unusual growth or invasive species** | No evidence of distress observed | |
| **Evidence of ground contamination** | None observed | |
| **Services - evidence of buried services** | None observed | |

# 5 Geological sites of special scientific interest and local geological sites

5.1.1 There are no geo-conservation resources identified within the study area.

# 6 Mining and minerals data

6.1.1 There are two mineral safeguarding areas which are affected by the route in this area both designated by Northamptonshire County Council. The first is to the south of the route, north-east of Brackley and just abuts the edge of the route alignment. The second is north-west of Radstone and is bisected by the route at the northern end of the study area.

6.1.2 The OCC Minerals and Waste Local Plan[2] does not identify any defined mineral safeguarding areas. However an area between Finmere and Mixbury has been designated by OCC as a mineral consultation area for sand and gravel resources. Extraction in part of this area is currently occurring as part of Finmere Quarry and there is one planning application in place in the study area for Finmere quarry; details are presented in Table 56.

6.1.3 The Buckinghamshire Minerals Waste Core Strategy development plan document[3], confirms that the route will not pass through any MSA, mineral consultation areas or sites of current extraction.

[2] Oxfordshire County Council, (1996), *Minerals and Waste Local Plan,* Saved Policies 2007.
[3] Buckinghamshire County Council,(2011), *Minerals and Waste Core Strategy,* Adopted November *2012.*

Table 56: Finmere Quarry planning data

**PLANNING & REGULATION COMMITTEE – 6 DECEMBER 2010**

**APPLICATION 1**

**APPLICATION TO CONTINUE DEVELOPMENT WITHOUT COMPLYING WITH CONDITION A3 OF PLANNING PERMISSION REFERENCE APP/U3100/A/06/2030592 (EXTENSION TO FINMERE QUARRY TO EXTRACT SAND AND GRAVEL FROM LAND SOUTH-WEST OF FINMERE, INCLUDING THE RELOCATION OF PLANT AND RESTORATION OF THE QUARRY USING IMPORTED INERT WASTE TO AGRICULTURE, WOODLAND AND GRASSLAND AT FINMERE QUARRY LANDFILL, BANBURY ROAD, FINMERE, MK18 4AJ) FOR AN EXTENSION OF THE LIFE OF THE DEVELOPMENT OF THE CONSENTED EXTENSION TO FINMERE QUARRY**

**APPLICATION 2**

**APPLICATION TO CONTINUE DEVELOPMENT WITHOUT COMPLYING WITH CONDITION B3 OF PLANNING PERMISSION REFERENCE APP/U3100/A/06/2030619 (EXTRACTION OF SAND, GRAVEL AND CLAY FROM LAND SOUTH OF THE CURRENT FINMERE QUARRY LANDFILL FACILITY FOR USE AT THE SITE FOR LANDFILL ENGINEERING AT FINMERE QUARRY LANDFILL, BANBURY ROAD, FINMERE, MK18 4AJ) FOR AN EXTENSION OF THE LIFE OF THE DEVELOPMENT OF THE CONSENTED EXTENSION TO FINMERE QUARRY**

**Report by Interim Head of Sustainable Development**

**Location:** Finmere Quarry, Finmere, Oxfordshire

**Applicant:** Premier Aggregates Ltd.

**Application No:** 10/01516/CM (Application 1) & 10/01515/CM (Application 2)

**District Council Area:** Cherwell

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## Introduction

1. In 2007 two planning permissions were granted, on appeal, for mineral extraction at Finmere Landfill quarry complex. The first of these was for sand and gravel extraction on land to the southwest of the existing landfill (reference number APP/U3100/A/06/2030592). The second was for sand, gravel and clay extraction on land to the south of the existing landfill (reference number APP/U3100/A/06/2030619). These permissions have not yet been implemented. Both permissions had conditions attached requiring a start date within three years. Consent has now been granted (in November this year under delegated powers) to extend the period for commencement (by a further 3 years). Accordingly the proposals that are the subject of this report seek to extend the end date of the existing permissions by 3 years for application 1 and 5 years for application 2 respectively.

## Location

2. Finmere Quarry landfill site is located some 7 miles north of Bicester in the north-east of Oxfordshire adjacent to the boundaries with Northamptonshire and Buckinghamshire.

## The Site and Its Setting (Plan 1)

3. The application sites are located within and adjacent to the existing sand and gravel quarry at Finmere which is accessed from the A421 which runs east-west to the north of the site. The site lies within an Area of High Landscape value within a predominantly agricultural and countryside setting.

4. Finmere village lies 450 m to the north east with the closest individual property being Widmore Farm, immediately to the west of the application site 1; Foxley Fields Farm bungalow some 220m to the north of application site 2 (owned by the applicant) and Boundary Farm 180m to the southeast of application site 2.

5. There are a number of public rights of way in the vicinity of and crossing the site. Bridleway 7 runs from Finmere in a generally southerly direction to the south of Foxley Farm. Bridleway 4 runs from Widmore Farm to Finmere.

## Background Information and History

6. The quarry was originally granted planning permission for sand and gravel extraction, on appeal, on 12 July 1993 (ref: APP/U3100/A/91/CHS 511/90 182742). Since that time planning permission has been granted for infilling with industrial and commercial waste (April 1998) and in July 2005 this planning permission was varied to continue the development and increase the height of the landfill.

7. The two mineral extraction sites were originally granted planning permission (again on appeal) in October 2007. Both permissions have yet to be implemented due to the effects of the economic recession and the stalled progress of landfill operations during 2007 - 2009. Planning permission has

just been granted (in November 2010) to extend the period for commencement of the development by a further 3 years.

## Details of the Development

### Application 1: Sand and Gravel Extraction, Land South-West of Finmere Quarry

8. Preparatory works for mineral extraction were due to be carried out at this site in 2008 with mineral extraction anticipated to commence in 2009. The applicant states that there are two reasons for delays in this process: firstly that negotiation with the landowner was delayed and secondly that the company was hit by the economic recession. The applicant states that they now anticipate preparatory works commencing at the site in 2011. This proposal therefore seeks to allow an extension to the end date of mineral extraction (by 3 years) to take account of the failure to commence working within the originally agreed 3 year start date.

9. Condition A3 of planning permission APP/U3100/A/06/2030592 currently states:

*Extraction of minerals shall cease by 31 December 2013 and deposit of waste shall cease by 31 December 2015.*

10. The applicant is seeking the following modification to Condition A3:

*Extraction of minerals shall cease by 31 December 2016 and deposit of waste shall cease by 31 December 2018.*

### Application 2: Sand, Gravel & Clay Extraction, Land South of Finmere Quarry

11. Sand, gravel and clay extraction for this site was due to start in 2007 progressing alongside the existing landfill operations. The materials are to be used for cell engineering within the adjacent landfill. Landfill operations ceased from 2007 to 2009 and so the need for the materials for engineering of landfill cells has not yet arisen. The applicant states that the need for the minerals by the adjacent landfill development still remains and mineral extraction is planned to recommence in mid-2011. The applicant is therefore applying to extend the date for the cessation of mineral extraction until 2017 (an additional 5 years) with a restoration to be completed by 2019.

12. Condition B3 of planning permission APP/U3100/A/06/2030619 currently states:

*Extraction of minerals shall cease by 31 December 2012, deposit of quarry reject material materials shall cease by 31 December 2013 and restoration shall be completed by 31 December 2014. Buildings, plant and machinery to which this permission relates shall be removed by 31 December 2014.*

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13. The applicant is seeking the following modification to Condition A3:

*Extraction of minerals shall cease by 31 December 2017, deposit of quarry reject materials shall cease by December 2018 and restoration shall be completed by 31 December 2019.*

## Consultation Responses and Third Party Representations

(21 day consultation period expired 28 October 2010)

**Cherwell District Council**

14. No objection subject to a similar time limit to be retained for restoration.

**Finmere Parish Council**

15. Object since the continued "drip-feed" of extensions is wholly inappropriate for a site that was originally due to close in 2007. The applications run contrary to OMWLP policy W7 which relates to the timeliness of restoration of a site after works have commenced.

**Newton Purcell Parish Council**

16. No objection as long as they stay within the height limits specified.

**Thames Water**

17. No response received.

**Environment Agency**

18. No objection.

**Natural England**

19. No objection.

**County Rights of Way Officer**

20. MW.0140/10 – Temporary diversion of Finmere Bridleway 7 would need to be extended in line with the revised end date.

21. MW.0142/10 – Temporary diversion of Finmere Bridleway 4 and Bridleway 7 would need to be extended in line with the revised end date.

**County Ecologist Planner**

22. No objections to either of these proposals from a biodiversity or landscape point of view.

**County Archaeologist**

23. No objection

**Transport Development Control**

24. No objection.

## Representations

25. One letter has been received that raises the following concerns:

- Previous commitments made by the applicant to gain further permissions have not yet been adhered to.

- All planning applications in the vicinity of the potential route for High Speed Rail (HS2) to be postponed until after the final route decision is made.

## Relevant Development Plan and other Policies

26. Development should be decided in accordance with the Development Plan unless material considerations indicate otherwise.

27. The Development Plan for this area comprises the saved policies of the Oxfordshire Structure Plan, Oxfordshire Mineral and Waste Local Plan (OMWLP) and Cherwell Local Plan 1996 (CLP) and Non-Statutory Cherwell Local Plan (NSCLP) .

28. The South East Plan (SEP) also formed part of the Development Plan prior to July 2010. However, in July 2010 the Secretary of State (SOS) revoked Regional Strategies which included the SEP. A recent judgement in the High Court in favour of CALA Homes (who challenged the decision of the SOS) means that the SEP remains in force for the time being though the Secretary of State has still expressed his intention to abolish regional plans through the process of the Localism Bill.

29. The government guidance in Mineral Policy Statement (MPS1) is also material to consideration of the proposal.

30. All relevant policies are listed in the policy annex (Item 7). Key policy considerations are whether there is still a need for these minerals and whether extending the end dates of the existing planning permissions is acceptable subject to satisfactory restoration.

31. In terms of need for the mineral government guidance in MPS1, SEP policy M3 and OMWLP policy SD1 and SD5 is relevant. For environmental and amenity impacts, policies to be considered include ENV1 of Cherwell Local Plan (CLP) and Policy EN34 of Non-Statutory Cherwell Local Plan (NSCLP). For restoration of the sites policy PE13 of OMWLP is applicable.

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## Comments of the Head of Sustainable Development

32. The key planning issues to consider in this instance are whether the proposed extension of the end dates for these applications is acceptable in terms of: i) the continuing need for the mineral ii) any environmental and amenity impacts and iii) ensuring restoration of the sites within a reasonable timescale.

(i) Need for Minerals

33. The principle of allowing these developments in their existing location has already been established as acceptable. The main issue with these proposals therefore is whether, in the case of the first application, the need for the mineral continues to exist. Using the figures outlined in the SEP the landbank of permitted reserves is well below the 7 years requirement (currently the County's landbank stands at about 4 years). Allowing the time limit to be extended for completion of this development would enable the reserve to contribute to the maintenance of a landbank in accordance with OMWLP policy SD1.

34. Clay extraction at this location is not supported by OMWLP policy SD5. However, the principle of clay extraction from the site has already been established through the existing consent granted on appeal. The mineral is to be used for engineering purposes at the adjacent landfill site. I consider that this position has not changed and that the clay is still required for lining purposes of the landfill site.

(ii) Environmental and Amenity Impacts

35. There have been no issues raised by consultees or local residents regarding environmental and amenity impacts from these developments. I do not consider that the environmental conditions at the site and in the surrounding area will change as a result of these proposals. In my view the proposed extended time period does not jeopardize the aims of CLP policy ENV1 and NSCLP policy EN34.

(iii) Restoration

36. These proposals raise the issue of whether the sites can still be considered to be capable of restoration in a timely manner if the extensions to the end dates are allowed. Finmere Parish Council have expressed concern about extensions.

37. The current end date for operations in the adjacent landfill site is 31 December 2021. If planning permission was granted then extraction of clay, sand and gravel would take place up to 2018 with restoration completed by 2019. This proposed timescale is therefore within the consented timescales for landfill operations generally on the site and subsequent restoration. The restoration schemes for the development sites were agreed at the time of original consents and this situation remains unchanged. Therefore, in my view, the proposals are consistent with the aim of policy PE13 of OMWLP.

38. Planning permission for these two sites to extend the start date for implementation (for an additional three years) was granted at the beginning of November, 2010. Accordingly it is in my view reasonable to allow similar extension of the end dates to enable extraction of the mineral reserve and allow proper restoration of the sites.

(iv) Other issues

39. One local resident has commented about the lack of adherence of the applicant to previous commitments to gain further permission. I am not aware of any commitments that the applicant might have made in this respect. The resident also makes the point about not determining the applications until the route for the HS2 had been determined. In response I would say that all applications have to be determined in a timely manner, and it would not be appropriate to delay making a decision on these applications whilst waiting for a decision on an infrastructure project that may take place sometime in the future.

**Conclusion**

40. Permitting these proposals would allow the applicant to access mineral reserves at the site which would contribute to the County's sand and gravel landbank in accordance with the SEP and OMWLP policy SD1. The proposal would enable clay to be provided for adjacent landfill engineering which would avoid the need to import it. The proposal therefore complies with OMWLP policy SD5.

41. There is no change intended to the operations on the site and the environmental setting of the proposals since the granting of the original planning permission. I consider therefore that the proposals accord with CLP policy ENV1 and NSCLP policy EN34.

42. Whilst extending the end dates for both applications, the proposed timescale for restoration is still within the consented timescales for the adjacent landfill operations and restoration. Therefore, the proposals in my view are consistent with the aims of policy PE13 of OMWLP.

**RECOMMENDATION**

**Application 1**

43. **It is RECOMMENDED that planning permission for Application 10/01516/CM be granted subject to the same conditions attached to the earlier consents and covering the following matters:**

**(1) Detailed compliance condition;**
**(2) Commencement date – 3 years (October 2012);**
**(3) Extraction to cease by 2016 and deposit of waste cease by 2018;**
**(4) Extraction limited to sand and gravel and no clay extraction;**
**(5) Removal of buildings, plants and machinery within 1 year of cessation of mineral working;**

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(6) No commencement of mineral extraction until approved pre-development works including diversion of Bridleway 4 had been carried out;
(7) No construction of silt pond except in accordance with the approved plan;
(8) Display of copy of the permission and approved plans in the operator's office;
(9) No importation of aggregate to the site except from the adjacent permitted land;
(10) Restriction of permitted development rights;
(11) Carrying out of operation according to agreed operating hours;
(12) Use of access according to approved plans;
(13) No mud on the public highway;
(14) Carrying out of development in accordance with approved wheelwash system;
(15) No development shall take place except in accordance with approved dust suppression measures;
(16) Limitation on noise level (to agreed level);
(17) Effective silencers to be provided on plant, machinery and vehicles;
(18) Noise emitted from the site shall not contain any discrete continuous noise;
(19) Reversing vehicles shall not emit warning noise that may have adverse impacts on neighbours or properties;
(20) Chemical or fuel storage containers to be sited on impervious surface with bund walls;
(21) Repair, maintenance and refuelling of plant and machinery to take place on an impervious surface drained to an interceptor;
(22) No permanent dewatering of the Great Oolite Series aquifer. Temporary dewatering shall not take place except in accordance with an approved scheme;
(23) No external lighting to be installed at the site except in accordance with an approved scheme;
(24) No development to take place until the developer had secured implementation of a programme of archaeological investigation;
(25) No removal of trees or hedgerows to take place between 1 March and 31 August inclusive in any year;
(26) Mitigation measures for protected species according to approved scheme;
(27) No removal of trees containing bat roosts;
(28) Straw bales to be erected according to approved restoration plan;
(29) All disturbed areas of the site and all topsoil, soil making material and overburden mounds to be kept free from agricultural weeds;
(30) Temporary soil storage bunds to be grass seeded;
(31) All topsoil and subsoil to be permanently retained on site and used in restoration;
(32) Topsoil, subsoil and soil making material to be stripped in a dry and friable condition;
(33) Soil handling, storage and placement to be carried out in accordance with the approved scheme;
(34) Temporary soil storage bunds shall not exceed 5 metres in height;

(35) Restoration to be completed only in accordance with the approved restoration scheme;
(36) Detail of planting for grassland restoration area to be agreed;
(37) An aftercare scheme to be submitted within 5 years of the permission;
(38) Operator to provide a detailed annual aftercare programme before 31 March of every year during the aftercare period;
(39) Operator to arrange a site meeting before 31 March of every year during the aftercare period;
(40) No deposit of waste other than inert waste.

**Application 2**

44. It is **RECOMMENDED** that planning permission for Application 10?01515/CM be granted subject to the same conditions attached to the earlier consents and covering the following matters:

(1) Detailed compliance condition;
(2) Commencement date – 3 years (October 2012);
(3) Extraction to cease by 2017, deposit of waste to cease by 2018 and restoration to be completed by 2019;
(4) Display of copy of the permission and approved plans in the operator's office;
(5) Mineral excavated from the site not to be transported on to the public highway;
(6) No quarry rejects materials to be imported to the site except from the permitted area;
(7) No stockpiling of clay on site;
(8) No soil stripping until Bridleway 7 has been temporarily diverted;
(9) Restriction of permitted development rights;
(10) Carrying out of operation according to agreed operating hours;
(11) No extraction of mineral below the approved level;
(12) Use of access according to approved plans;
(13) Provision of a site access road before commencement of soil stripping;
(14) Water bowser to be used to eliminate visible dust;
(15) Limitation on noise level (to agreed level);
(16) Effective silencers to be provided on plant, machinery and vehicles;
(17) Noise emitted from the site shall not contain any discrete continuous noise;
(18) Reversing vehicles shall not emit warning noise that may have adverse impacts on neighbours or properties;
(19) Chemical or fuel storage containers to be sited on impervious surface with bund walls;
(20) Repair, maintenance and refuelling of plant and machinery to take place on an impervious surface drained to an interceptor;
(21) Clay to be retained at the base of any extraction of at least 1 metre thickness;

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(22) No permanent dewatering of the Great Oolite Series aquifer. Temporary dewatering shall not take place except in accordance with an approved scheme;
(23) No external lighting to be installed at the site except in accordance with an approved scheme;
(24) No development to take place in phase 2 until the developer has secured the implementation of a programme of archaeological investigation;
(25) No removal of trees or hedgerows to take place between 1 March and 31 August inclusive in any year;
(26) No removal of trees containing bat roosts;
(27) All disturbed areas of the site and all topsoil, soil making material and overburden mounds to be kept free from agricultural weeds;
(28) Temporary soil storage bunds to be grass seeded;
(29) Straw bales to be erected according to approved restoration plan;
(30) All topsoil and subsoil to be permanently retained on site and used in restoration;
(31) Topsoil, subsoil and soil making material to be stripped in a dry and friable condition;
(32) Soil handling, storage and placement to be carried out in accordance with the approved scheme;
(33) Temporary soil storage bunds shall not exceed 5 metres in height;
(34) Restoration to be completed only in accordance with the approved restoration scheme;
(35) Detail of planting restoration area to be agreed;
(36) An aftercare scheme to be submitted within 5 years of the permission;
(37) Operator to provide a detailed annual aftercare programme before 31 March of every year during the aftercare period.
(38) Operator to arrange a site meeting before 31 March of every year during the aftercare period.

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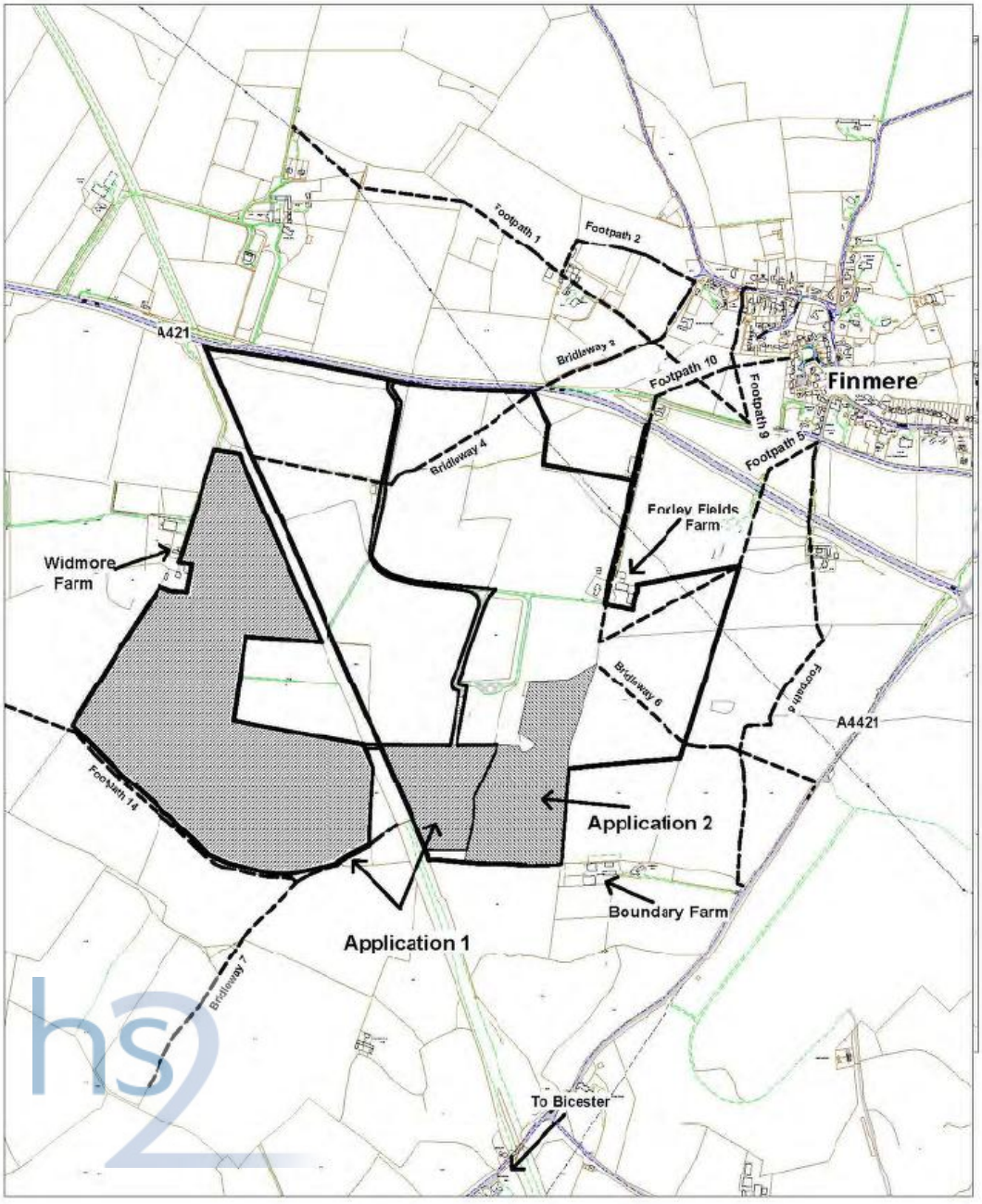
# Plan 1


Footpath 1
Footpath 2
A421
Bridleway 2
Footpath 10
Footpath 9
Footpath 5
Finmere
Bridleway 4
Forley Fields Farm
Widmore Farm
Bridleway 6
Footpath 6
A4421
Footpath 14
Application 2
Boundary Farm
Application 1
Bridleway 7
To Bicester

# 7 References

Buckinghamshire County Council, (2011), *Minerals and Waste Core Strategy*, Adopted November 2012.

Defra and Environment Agency, (2002), *R&D Publication - Potential Contaminants for the Assessment of Land.*

Oxfordshire County Council, (1996), *Minerals and Waste Local Plan,* Saved Policies 2007.